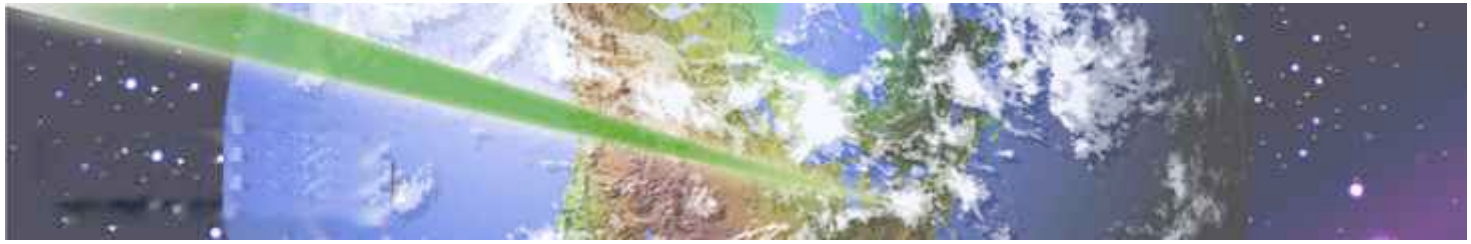


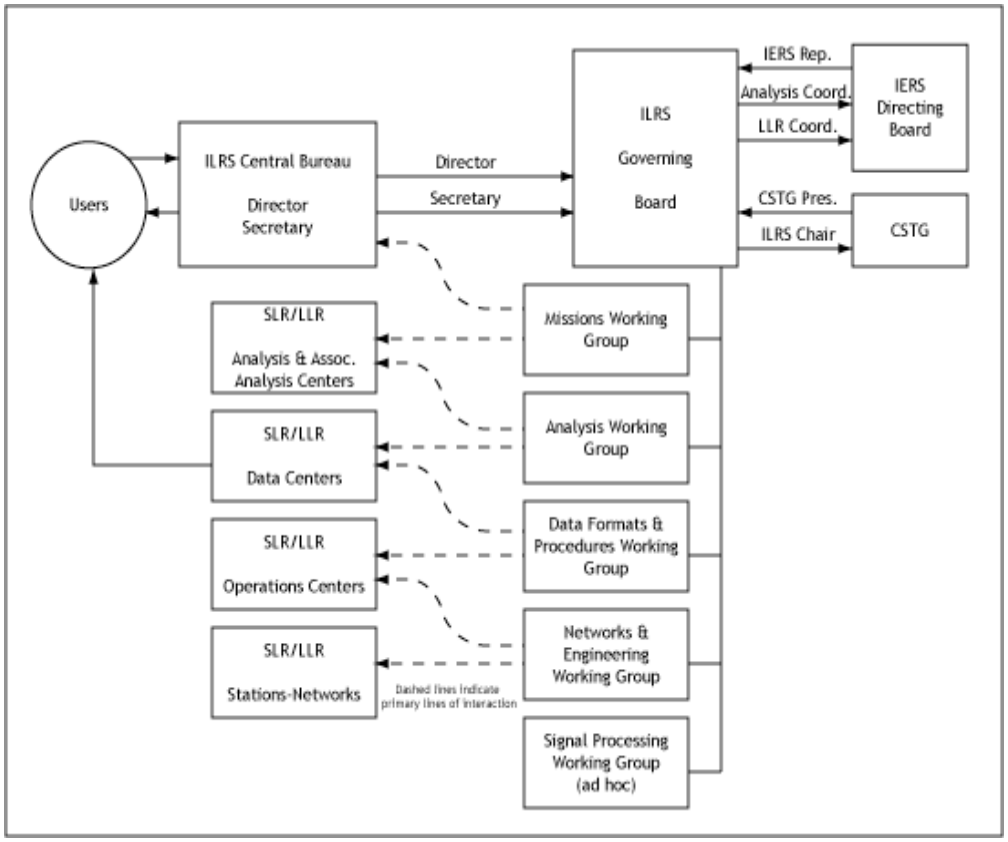
Satellite Laser Ranging Concept Review

Current SLR Network
David Carter

Goddard Space Flight Center
Greenbelt, Maryland
July 26, 2004

Map of International Laser Ranging Service (ILRS) Network

ILRS Organizational Structure



- Over 70 organizations located in 27 countries participate in the ILRS
- NASA operates the ILRS Central Bureau
- NASA actively participates in all ILRS entities (Governing Board, Working Groups, operational components)
- ILRS supports NASA Missions and Programs

MOBLAS System at GSFC

NASA SLR System Characteristics

MOBLAS

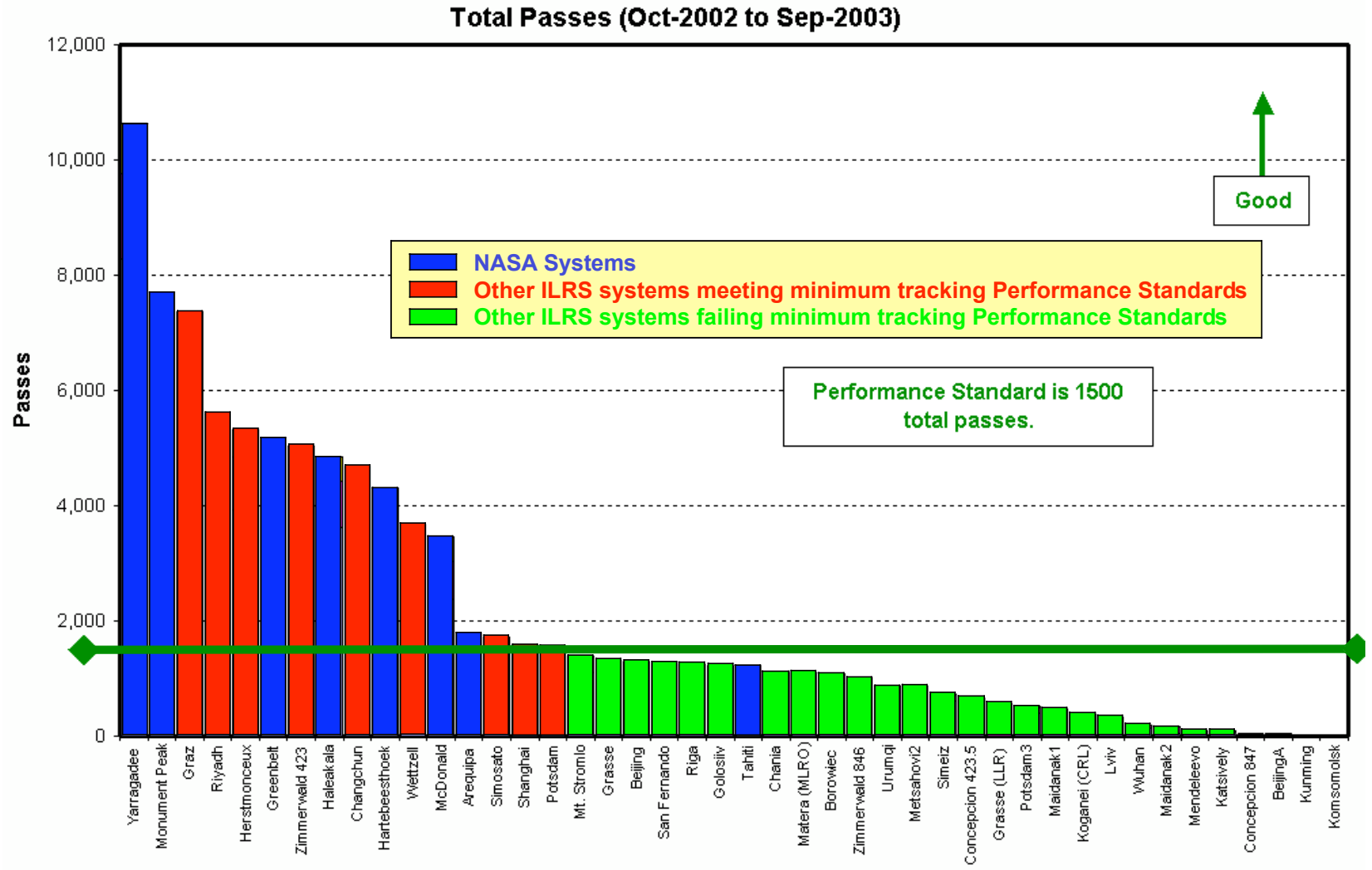
MLRS

- Single person operations per shift
- Hourly data delivery with near real-time capability
- Subcentimeter ranging precision
- 5 to 10 Hz Repetition Rate
- Aircraft Monitoring: Radar system/mount observer

TLRS

HOLLAS

NASA SLR Data Quantity



SLR Operational Task Contract

- SLR operational task with Honeywell Technical Services, Inc. (under the NENS contract)
- Provides network operations at GSFC (MOBLAS-7) & Monument Peak, California (MOBLAS-4)
- Sustaining Engineering Support for NASA SLR network
- Data operations for NASA SLR network (data reception, data processing, data quality analysis, & acquisition data generation)

University Operated Sites

- **University of Hawaii:**
  - Contract with Institute for Astronomy (IfA) expired in June 2004
  - SLR site located on Mount Haleakala in Maui, Hawaii
  - Provided SLR operations, scheduling, maintenance, engineering support, and software development (collocated with GPS)
- **University of Texas:**
  - Contract with Univ. of Texas at Austin (CSR)
  - SLR site located at McDonald Observatory in Fort Davis, Texas
  - Provides SLR & LLR operations, scheduling, maintenance, engineering, software development, data analysis and quality control (collocated with GPS)
- **Universidad Nacional de San Agustin (UNSA):**
  - Contract with UNSA (in process of being negotiated)
  - SLR site located in Arequipa, Peru
  - Provides SLR operations and maintenance (collocated with GPS)

NASA SLR Overseas Partnerships

- **Australia:**
  - Collaboration with Geoscience Australia (GA formerly AUSLIG)
  - MOBLAS-5 operations in Yarragadee, Western Australia transferred to GA in January 1999 (collocated with GPS)
- **French Polynesia:**
  - Collaboration with CNES & University of French Polynesia (UFP)
  - MOBLAS-8 operations in Tahiti transferred to UFP in May 1998 (collocated with GPS, DORIS)
- **South Africa:**
  - Collaboration with the South African National Research Foundation (NRF) & Hartebeesthoek Radio Astronomical Observatory (HRAO)
  - MOBLAS-6 operations at HRAO in August 2000 (collocated with VLBI, GPS, DORIS)

Limitations of Current SLR Network

- Antiquated equipment (25 plus years old)
- Limited spare parts availability
- Costly to operate & maintain
- Chemical and high voltage hazards
- Incompatible systems
- Further automation not cost effective
- Limited tracking capability for GPS orbits (20,000 km) and beyond